Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

$$= \log c\,t + t\,n\left(-\frac{q}{a} - \frac{q^2}{2\,a^2} - \frac{q^3}{3\,a^3} - \&c.\right).$$

Neglecting powers of infinitesimals, we have

$$\log\left(\frac{c\,t}{Q}\right) = \frac{t\,n\,q}{a} = \frac{c\,t}{a}.$$

$$\therefore e^{\frac{c\,t}{a}} = \frac{c\,t}{Q}. \quad \therefore Q = c\,t\,e^{-\frac{c\,t}{a}};$$

where e denotes the base of the Napierian system of logarithms.

[This question was solved by Prof. Evans in an elegant manner by the method of finite differences, and in nearly the same manner as the above by Prof. Sensenig. All the other solutions were by application of the differential and integral calculus.]

* * *

QUERY —Can a demonstration be given of the following formula for primes?

$$N = \frac{x}{A \log x - B};$$

in which N denotes the number of prime numbers contained in any number x, and A and B are constants.—Communicated by PROF. EDWARD BROOKS.

* * *

NOTE ON SUN SPOTS.—One might easily gather from reading astronomical works, that solar spots are rarely visible to the naked eye; that is, without the use of a telescope; but such is not the case. Let any one who feels an interest in the subject, prepare a suitable smoked glass, and examine the sun's disk daily, or as often as the clouds will permit, and he will find that solar spots can frequently be seen without a telescope. If it were worth the space to record the observations, I could give numerous instances when I saw spots without a telescope, and I have occasionally seen two at a time.

Since the sun's spots return periodically once in about eleven years; that is, from the minimum average number they gradually increase in number and area till the maximum is reached in about five and a half years, when the number gradually decreases; large spots are more likely to be seen about the time of the maximum number.

To discover a solar spot without a telescope, keep the eye directed attentively on the sun (always using a smoked glass, or something equivalent) for a minute, and sometimes for several minutes, and the probability is that a spot, which at first could not be seen, will become visible.—Communicated by **Prof. D. Trowbridge.**

* * *

Query.—The strain on the internal surface of a steam boiler tending to produce longitudinal rupture, is, per unit of length, equal to the product of the elastic pressure of the steam per unit of surface multiplied by the diameter of the boiler. What should be the relative thickness of the flat ends of a boiler, so that, without bracing, they are just strong enough to withstand the maximum strain that the boiler will bear?

* * *

PROBLEMS.

11. Borrowed a sum of money at 8 per cent. simple interest and loaned it out again at 5 per cent. compound interest; in what time will I gain the amount borrowed?—Communicated by E. W. Fosdick, Esq., Butler, Indiana.

12. Given the base $A\ C$ of a triangle and the ratio of $A\ B$ to $B\ C$ to find the locus of the point B by Geometry.—Communicated by L. **Regan,** Boonsboro, Iowa.

13. A body is projected at a given distance from the center of force with a given velocity, and in a direction perpendicular to that distance: When the force is repulsive and varies inversely as the cube of the distance, find the path of the body:—Communicated by J. B. **Sanders,** Troy, Indiana.

14. Two equal particles attracting each other with forces varying inversely as the square of the distance, are constrained to move in two straight lines at right angles to each other; supposing their motions to commence from rest, to find the time in which each of them will arrive at the intersection of the two straight lines.—Communicated by **Prof. J. M. Greenwood,** Kirksville, Mo.

15. Two points are taken at random in the surface of a given circle and a chord drawn through each at random; show that the chance that the chords intersect is

$$\frac{1}{3} + \frac{5}{2\pi}.$$

—Communicated by E. B. **Seitz,** Greenville, Ohio.